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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/623,946	11/03/2000	Josef Laumen	1324	2110

7590

09/20/2005

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EXAMINER

CHAUDRY, MUJTABA M

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/623,946	Applicant(s) LAUMEN ET AL.	
	Examiner Mujtaba K. Chaudry	Art Unit 2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/12/2000</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements (IDS) submitted on September 12, 2000 and April 23, 2001 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner has considered the information disclosure statements.

Response to Amendment

Applicant's arguments/amendments with respect to pending claims 1-8 and 10-12 filed July 18, 2005 have been fully considered but are not persuasive. The Examiner would like to point out that this action is made final (See MPEP 706.07a).

Applicant contends, "...Gordon (prior art of record) does not mention the fire code in the context of variable redundancy..." The Examiner respectfully disagrees. Gordon teaches an arrayed disk drive system for providing memory to a computer, said arrayed system having a plurality of disk drives configured to form an array, said **arrayed disk drives accessed by a plurality of channels**, each channel accessing a plurality of disk drives, including a means for controlling the logical configuration of the arrayed disk drives to appear to the computer as any conceivable arrangement of disk drives, whereby the arrayed disk drive may appear to the computer as the plurality of disk drives, or as one large disk drive comprised of all the arrayed disk drives, or any combination in between. A means for **providing a plurality of levels of redundancy on data read or written by the computer to the arrayed disk drives** is provided, as well as means controlled by the controlling means for enabling from none to the plurality of

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levels of redundancy to operate on data being read or written from the arrayed disk drives.

Furthermore, Gordon teaches (col. 16) the HISR process block 72 is the host computer 32 interrupt service routine process. The HISR process 72 does all the handshaking with the host.

The HISR send input/output parameter blocks (IOPB) 74 from the host to the HTASK along

with some control signals. The HTASK process block 76 is the primary process block. It

handles all input/output (write/read) requests from the host 32. It is also responsible for: (1)

implementing variable redundancy schemes, (2) striping blocks of data in 512, 1024, etc.

block distributions, (3) mapping logical disk memory to the physical disk drives 14, (4)

performing the redundancy operation, queuing excess IOPBs, (5) accessing spare disk drives 15,

and (6) allocating microprocessor memory 42 to resemble a physical sector when that physical

sector is removed or defective.

Furthermore, the Examiner would like to point out that, according to the claims of the present application, **the variable redundancy depends on the variable C, which can be freely set.** Hence, **Wicker teaches this aspect and therefor variable redundancy is inherent for fire codes** since C is a variable and can be freely set.

The Examiner disagrees with the Applicant and maintains rejections with respect to pending claims 1-8 and 10-12. All arguments have been considered. It is the Examiner's conclusion that pending claims 1-8 and 10-12, as presented, are not patentably distinct or non-obvious over the prior art of record. See prior office action:

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephen B. Wicker (**Error Control Systems** – ISBN 0132008092) further in view of Gordon et al. (USPN 5148432).

As per claims 1, 3, 6-7 and 10-12, Wicker teaches (text: pages 437-440) encoding and decoding data using Fire codes. Wicker teaches (p. 437, paragraphs 2-3) Fire codes that are capable of correcting a single burst in a variable-length code word as stated in the present application. Wicker teaches (p. 438) coding data with a fire code of generator polynomial, $G(x) = (x^{(2b-1)} + 1) * g(x)$ where $g(x)$ is a irreducible polynomial of degree m and the value of b may be free set within predetermined limits as stated in the present application. Applicant uses the polynomial $G(x) = (x^{(c)} + 1) * P(x)$ and states in the specification (p. 7 of application) that $c = 2b - 1$.

Wicker does not explicitly teach the variable “c” in the irreducible polynomial to be changeable so that the variable redundancy can be obtained as stated in the present application.

However, Gordon et al. (herein after Gordon), in an analogous art teaches (title and abstract) an arrayed disk drive system for providing memory to a computer, wherein the arrayed system has a plurality of disk drives configured to form an array. The arrayed disk drives are accessed by a plurality of channels, each channel accessing a plurality of disk drives, including a means for controlling the logical configuration of the arrayed disk drives to appear to the computer as any conceivable arrangement of disk drives, whereby the arrayed disk drive may appear to the computer as the plurality of disk drives, or as one large disk drive comprised of all the arrayed disk drives, or any combination in between. Particularly, Gordon teaches a means for providing a plurality of levels of redundancy on data read or written by the computer to the arrayed disk drives is provided, as well as means controlled by the controlling means for enabling from none to the plurality of levels of redundancy to operate on data being read or written from the arrayed disk drives. Gordon teaches (col. 7, lines 55-65) the parity or error detection and correction scheme used by the embedded SCSI controller is referred to as Fire code. Fire code is a mathematical code for detecting and correcting short bursts of errors within a very long field. The fire code generator, a microprocessor and a microprocessor memory are all located within the disk drive 14 itself. Furthermore, Gordon teaches (col. 16-17) to implement variable redundant schemes.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporated adaptability for Fire Codes of Gordon within the teachings of Wicker to form the present method and apparatus. This modification would have been obvious to one of ordinary skill in the art at the time the invention was made because one of ordinary skill in the art would have recognized that by varying the value of "C" in the irreducible polynomial

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of the fire code would have enhanced the error detecting/correcting capability since the system would be adaptive.

As per claims 2, 4 and 5, Wicker teaches (p. 438-439) the technique to calculate the value for $2b-1$, which is equivalent to c in the present application. Wicker also teaches (p. 437) a disk register whose length can be set to b , wherein b can be less than m as stated in the present application.

As per claim 8, Wicker teaches (p. 440) the Fire decoding operation in which the redundancy properties are incorporated as stated in the present application. In particular, steps 3 and 4 (p. 440) Wicker states if one syndrome is nonzero and the other is zero, then the codeword contains a uncorrectable but detectable error, which is analogous to d in the present application. The equation $(d = c + 1 - b)$ in the present application which may be interpreted as $c = (b + d) - 1$ wherein the term $b + d$ represents the bundle error and the detectable error and is incorporated in steps 3 and 4 of Wicker.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mujtaba K. Chaudry whose telephone number is 571-272-3817. The examiner can normally be reached on Mon-Thur 9-7:30.

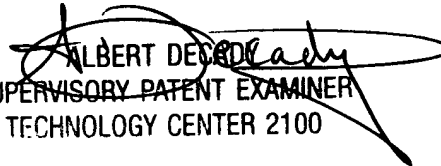
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mujtaba Chaudry
Art Unit 2133
September 7, 2005



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